



of EERE programs. Many different mechanisms are available for assessing and ensuring quality. Each of these mechanisms can play a significant role at some stage in the decision-making and evaluation process.

These mechanisms include:

- the use of external advisory committees to help establish major directions for EERE's programs or program priorities,
- the use of scientific project or discipline-oriented working groups (composed of EERE and non-EERE members) to help define projects or programs, look at balance and quality within a given program area, or assess progress on a project,
- visiting committees to assess institutional programs; the use of traditional peer review applied to fair and open competition to support decision-making regarding the support of individual tasks, and
- relying on the informed judgment of technically and scientifically competent program managers.

The appropriate use of expert review groups to assess progress on projects in development is also an important part of enhancing quality. EERE uses all of these mechanisms as appropriate to ensure the quality of its programs.

Assessments of the quality, effectiveness and impact of EERE projects and programs will be made on a regular basis through all stages of a program's or project's lifetime:

- when programs and projects are first identified and defined,
- when the actual participants are selected to carry out the work,
- during development and implementation for activities having well defined costs, schedules, and milestones,
- whenever major new scientific, technical, or programmatic developments raise significant questions about a particular program's validity or approach,

- following completion of a project's prime operating phase to see whether continued operations are warranted, and
- following project or program completion to see whether a program's goals were actually achieved and to assess the broad scientific and/or other contributions made by a given program.

Effort will be made to ensure consistent criteria over the life of a program. Continuing programs will be assessed on a periodic basis.

Such assessments are necessary not only for EERE self-evaluation, but also to meet new legislative mandates such as the Government Performance and Results Act of 1993. Further, EERE is committed to developing explicit criteria for making decisions and assessing quality and making both the criteria and the way the criteria are applied publicly available. EERE's decision making will be based on principles, which are broadly disseminated and are well understood by all participants.

## **B. External Review**

Two mechanisms for evaluating quality that involve the external community, advisory committees and peer review, are of particular importance.

### **i. The Use of Advisory Committees**

Advisory Committees and other external groups will continue to have a key role to play in the formulation and oversight of EERE's programs to ensure the highest quality in the national interest. EERE will seek advice, analysis and assistance from external communities. Although EERE has the ultimate responsibility for program formulation and evaluation, EERE seeks assistance in these and other tasks from, for example, the National Academies of Science and Engineering and through mechanisms such as EERE-formed advisory committees, working groups, management operations groups, steering committees and program review bodies.

The National Academies of Sciences and Engineering and the Institute of Medicine, for example, provide broad, often long-range advice, particularly concerning goals, objectives, strategies and priorities. EERE-formed committees and groups focus more

on programmatic issues and detailed technical questions. Both types of information are important for the planning and implementation of EERE programs and projects.

Members of such groups will be selected on the basis of individual competence and will come from a wide range of institutions, backgrounds and perspectives. Memberships on such groups will rotate on a regular basis to broaden the advice received and will include individuals not directly involved in EERE activities.

It must also be recognized that Advisory Committees and other external groups, while providing a vital mechanism for external community involvement in and ownership of EERE programs, are not always in a position to consider the full range of criteria that EERE must address including political, budgetary and programmatic issues. EERE managers must therefore combine the advice and information they receive from such groups with other information on priorities, costs, etc. to reach final decisions. In all cases, however, the criteria on which decisions are based will be made explicit.

## **ii. Peer Review**

Along with strategic planning and program evaluation, the use of peer review is an integral part of EERE's practices to ensure quality. In general, EERE evaluates program merit and priorities on the basis of peer review and advice from committees broadly representative of our customers.

Peer review is a process in which an unbiased group judges the significance and technical validity of proposed work of members of its own community. The goals of peer review are to:

- determine the quality, relevance, and value of the work being judged;
- identify the work most likely to succeed;
- investigate the relative merits of similar work proposed by competing groups; and
- demonstrate to internal and external communities that balance and fairness are achieved in arriving at decisions by making the relevant communities of experts themselves participants in the selection process.

EERE subscribes to these goals and will fully utilize peer review to ensure that fairness and quality are the foundations on which decisions concerning participation in its scientific programs are based.

To accomplish the goals of peer review, EERE will strive to ensure that:

- reviewers are genuinely knowledgeable and collectively cover the full range of expertise required for thorough proposal evaluation;
- attention is paid to conflicts of interest;
- EERE programmatic and technical needs and requirements are understood; they will be spelled out in the relevant solicitation; and
- criteria for evaluation are well defined and understood; accepted by the reviewers; traceable to the needs and requirements outlined in the solicitation; and spelled out in that solicitation.

A central role for EERE headquarters is to form diverse, expert review panels which encompass the full range of expertise required. Such expertise must be drawn from the widest possible talent pool. EERE Headquarters must also ensure that peer review panels are adequately informed about the requirements and constraints that proposals are expected to satisfy and that are an important part of the basis for evaluation. Another role is to identify and eliminate potential conflicts of interest in the peer review process. Since factors other than peer review may enter the decision-making process (see below), final selections are always the purview of an EERE official.

While the general principle regarding the use of competition and peer review applies across the Agency, an EERE-wide set of criteria or a uniform review process does not appear to be necessary. Different approaches are warranted by differences in goals, customer base, etc. among the various disciplines.

### **C. Other Factors Entering the Decision-Making Process**

Although the results of peer review are exceedingly important, other factors may enter the decision-making and selection pro-

cess. Policy directions or programmatic considerations (such as programmatic balance, cost) play a significant role.

One example of a justified departure from the principle of open competition and peer review is new activities or innovative but risky ideas that promise high gain. EERE is committed to funding such projects for a limited period of time with seed money to develop them to the point where they can compete. Managers may also select work needed to achieve particular programmatic needs. The results of such activities will be reviewed on a regular basis. In cases where commercial products may result from the research, internal government-only review may be most appropriate to protect proprietary information.

Programmatic or societal considerations can enter the decision-making process at several stages. Contributions to broad national needs identified by the Secretary, Administration or Congress play a substantial role in establishing priorities and in shaping or arriving at the decision to proceed with a particular project or program. EERE is part of the political system and its priorities are determined within that context.

For a given program, all considerations that are to play a significant role in the decision-making process (including, for example, contributions to technology and economic competitiveness) will be clearly spelled out in program and project participation solicitations and appropriate evaluation criteria identified. Peer review panels may then be suitably augmented to include appropriate expertise. Alternatively, peer review panels may focus on purely scientific and technical matters to define a competitive range within which programmatic, societal and other factors can then be used as discriminators in the final selection.

The application of these other factors is then the responsibility of the selecting official. Other approaches are also possible. Whatever approach is to be taken will be spelled out in advance so that all interested parties understand the process that will be used and the basis on which decisions will be made.

## **D. Metrics**

There are increasing demands for all Federal programs to measure the performance and effectiveness of their programs. The Government Performance and Results Act of 1993 requires each

Federal Agency to develop a strategic plan, set yearly goals and performance objectives for every major program area, and measure and report how well programs accomplish these goals. EERE also needs improved assessments of the effectiveness and contributions of its programs. In response to these requirements, a number of efforts are now underway both inside and outside of EERE to define and develop metrics for assessing the value and contributions of EERE programs.

EERE consults with its stakeholders and others to develop a meaningful and useful set of metrics. In developing these metrics, a number of general considerations are being taken into account:

- No single metric or group of metrics is likely to apply to EERE on a broad scale. Appropriate metrics have to be developed for different parts of the EERE program.
- In general, projects and programs have three distinct (but coupled) phases, each of which requires a different set of metrics.
  - The Program Initiation Phase for which metrics are focused on evaluating the importance of a program vis-a-vis competing programs, state-of readiness for initiation, and the level of resources needed for development. Scientific or technical merit, programmatic considerations, and contributions to meeting larger public needs may all play a role at this stage. Criteria to be developed also must be explicitly linked to EERE and the EERE programs able to make progress towards achieving their Vision.
  - The Program Development or Implementation Phase for which metrics are focused on measuring expected accomplishments or performance vs. cost and schedule.
  - The Program Retrospective Phase for which metrics are focused on understanding the degree to which intended goals were achieved and larger public benefits derived. Retrospective phase metrics must provide a genuine measure of value, must give the political system the information that it needs, must satisfy legitimate demands for accountability, and must measure true effectiveness and not just activity.

- It is generally easier to develop metrics for short-term activities that have a clear goal from their outset, than for long-term activities whose full impact is often not realized for many years and then in unexpected ways. Retrospective metrics are therefore often the most effective for evaluating the contributions of the latter.
- Metrics are needed to assess the effectiveness of EERE efforts to broaden participation in particular, to evaluate progress in broadening the responsibilities of universities and industry, in the formation of partnerships between EERE and these and other organizations, and in the inclusion of under represented groups.

Each evaluation should include metrics to assess the effectiveness and efficiency of EERE management of the programs and projects being evaluated.